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Equine Symposium

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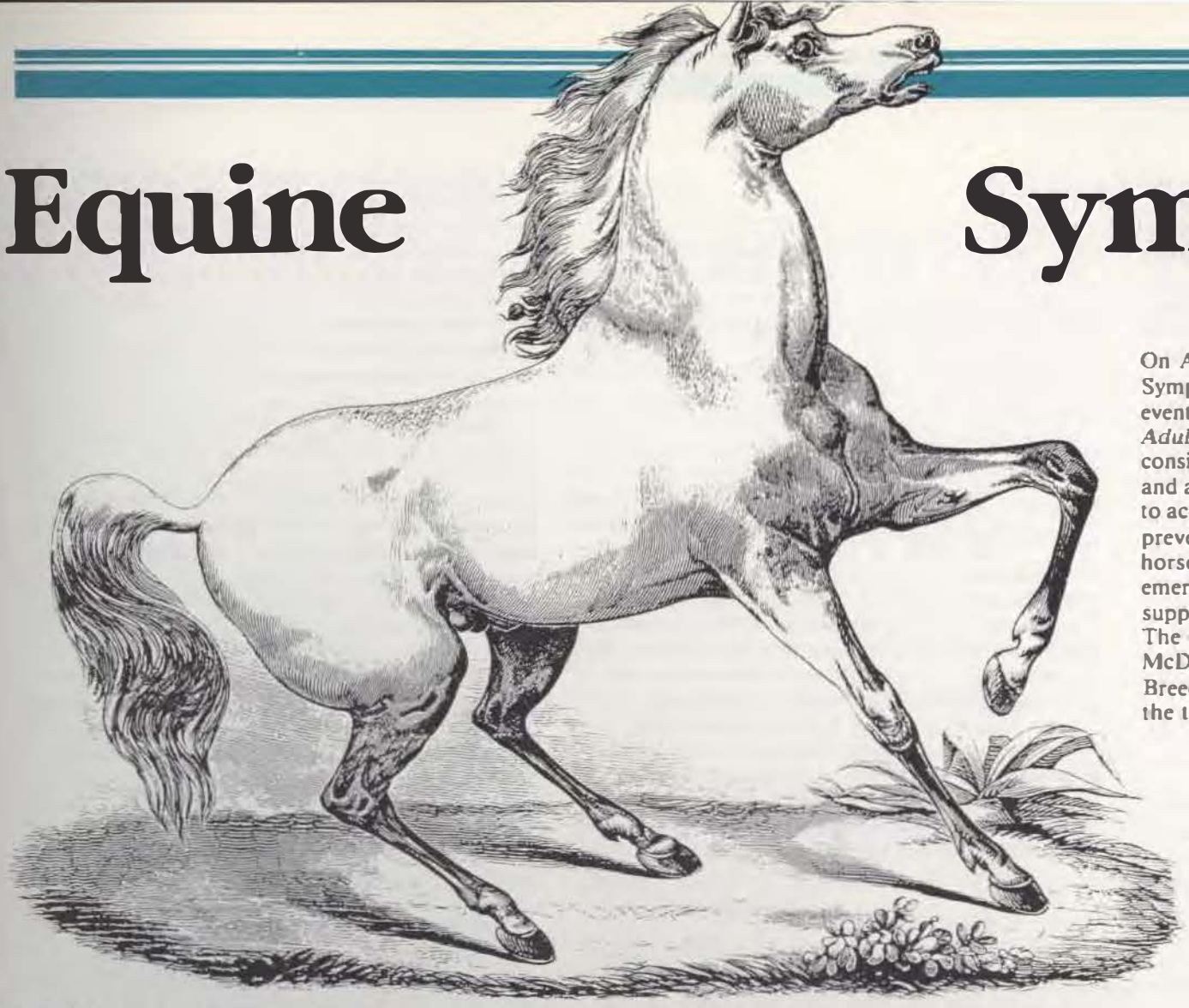

On April 30, 1988 the School hosted an Equine Symposium at its New Bolton Center campus. The event, entitled *Serious Problems in Neonates and Adult Horses — Candidates for Intensive Care*, consisted of five short lectures by faculty members and area practitioners. The symposium was designed to acquaint owners and farm personnel with ways to prevent serious medical and surgical problems in the horse; to provide knowledge of treatment when emergencies occur; and to understand the potential supportive benefit and limitations of intensive care. The program was moderated by Mr. Mark McDermott, executive secretary, Pennsylvania Horse Breeders Association. Following are summaries of the talks.

Philosophy of Preventive Medicine

Dr. John Lee, a Unionville practitioner, began the program with a discussion of the Philosophy of Preventive Medicine. Traditionally preventative medicine, in general, has consisted of a program covering immunizations and parasite control. However, it should encompass more than these two subjects. Concerns such as nutrition, pasture management, ventilation and appropriately timed veterinary examinations and clinical testing should all be included.

To have a successful program the veterinarian and the farm manager/owner need to be involved as a team. As the sophistication of treatments available to the equine industry increases, as exemplified by the new intensive care facility at the University of Pennsylvania School of Veterinary Medicine, so should the determination to prevent as many of the problems in advance as possible.

The information following not only applies to the mare and the foal, but also to the equine population in general. Dr. Lee stressed that a complete vaccination program can reduce the risk of life threatening diseases such as botulism, tetanus, encephalitis and rabies. It can also reduce the incidence of respiratory disease by protecting against infections caused by the rhinopneumonitis and influenza viruses. Table A outlines a program recommended by Dr. Lee.

Parasite damage and its secondary effects are still considered to be the cause of the majority of surgical and medical colics. Parasite control consists not only of frequent wormings and fecal examinations to measure the success of the wormer, but also includes pasture management. The effectiveness of worming is often negated by overgrazed, poorly managed pastures which act as a constant source of re-infestation by *Strongylus vulgaris* and other internal parasites. The current recommendation is to worm all horses younger than two years every month, and older than that every eight weeks. The veterinarian is the best source of information as to the type of wormer to use and in what rotation.

A number of problems can be eliminated through non-medical management. It is important that horses be kept in a well-lit and well ventilated barn. Ventilation is often overlooked as a contributor to disease, particularly in foals. They, due to their height, occupy the lower half of the stalls, where often the airflow is inadequate and this situation frequently increases their susceptibility to respiratory infections.

Dr. Lee also advised that horses which arrived from another facility be kept in isolation for a period of time to prevent the introduction of infectious diseases into the herd. He emphasized that close attention has to be paid to proper nutrition. It has been shown that a balanced diet can reduce the incidence of such common problems as metabolic bone disease and contracted tendons in the foal. In the adult athletic horse nutrition is of prime importance in obtaining maximum performance. Poor hoof growth, tying up, and impaction colics are other examples of possible nutrition problems.

Pasture plays an important part in the nutritional and exercise needs of the horse. It is often a neglected part of a farm's parasite control program. Dragging, vacuuming, and rotating of livestock all need to be considered as well as frequent fertilizing and replanting of grasses.

The time-honored procedures of dipping the navel of the newborn with iodine and giving an enema shortly after birth are still the first lines of defense against such problems as navel ill and meconium impaction. The foal should be kept in a warm, draft free environment, however, it should not be too humid as this situation stresses the foal's respiratory system.

All foals should be tested by twelve hours past the first nursing to determine whether they are absorbing maternal antibodies from the colostrum. If there is a failure of passive transfer, additional colostrum can be administered or a plasma transfusion can be undertaken. This will ensure that the foal has sufficient protection against most of the pathogens it is likely to encounter in the first weeks of life.

At the time the blood is drawn, the veterinarian should also do a brief physical exam and check the foal for gross abnormalities of eyes, heart, umbilical stump, lungs, etc. Often potential problems can be caught while they are easily treatable.

The mare's colostrum should be checked for its antibody level. This allows the veterinarian to know if the foal is likely to have received adequate antibodies. If the foal has too low an IgG (antibody) test result, one can then determine if the problem is the mare's lack of good colostrum or the foal's inability to absorb it. Testing the mare also guarantees that excess colostrum which may be frozen for future use will be worthwhile to keep on hand.

The preventive steps reviewed here are quite basic, however they can reduce veterinary costs and help in the maintenance of a herd of healthy horses.

TABLE A: VACCINATIONS AND OTHER PREVENTATIVE MEASURES

Immunization

Tetanus toxoid: Foals — two injections four weeks apart, starting at 6-8 weeks. Annual boosters thereafter. Given to pregnant mares 4-6 weeks before foaling date. If the horse is injured, it should have a current tetanus shot within six months, or a booster is required.

Influenza: Foals — two injections four weeks apart, starting at 6-8 weeks. Six months through two years of age — booster every three months. Given to pregnant mares 4-6 weeks before foaling date. Heavily campaigned horses should have boosters every 60-90 days.

Rabies: Initially one injection, then annual booster. Foals — should be over three months of age.

Eastern and Western Encephalomyelitis: Initially two injections given in the spring four weeks apart. Annual booster thereafter.

Botulism: Primarily given to pregnant mares — initially three injections given at 7, 9, and 10 months of pregnancy. One injection 4-6 weeks before foaling date thereafter.

Worming: Ideally foals should be started at 6 weeks of age and wormed every four weeks thereafter until two years old. Adult — should be wormed every eight weeks. Pregnant mares — should be wormed every 8 weeks up to the last 6 weeks before foaling.

Coggins: Once a year. Horses shipping out of state may need to have one current within six months.

Teeth floating: Once a year. Young and old horses should be checked every six months.

Foals Responsive to Intensive Care

Dr. Wendy Vaala, lecturer in medicine, provided a brief overview of foals requiring treatment in the neonatal intensive care unit.

In order to achieve the most favorable results from neonatal intensive care, the patient must be identified as early as possible. Factors predisposing to neonatal illness may be related to the mare's health and pregnancy, to events surrounding delivery, and to the foal's behavior and vital signs during the first days post partum. Table I lists normal parameters regarding pregnancy, birth and post partum foal behavior. Abnormal conditions associated with neonatal illness are listed in Table II.

Neonatal septicemia, a bacterial infection, is one of the most common causes of morbidity and mortality in the newborn foal. Early recognition and aggressive treatment are essential for a successful outcome. A case history will reveal that the birth in most cases was normal. If the infection was acquired *in utero*, the placenta may be thickened, edematous or abnormal in texture. The mare may have been ill. Affected foals often have not received enough colostrum.

The early signs of neonatal septicemia are generalized weakness, weak or absent suckle, depression, dehydration, elevated heart and breathing rates, variable body temperature (subnormal temperature if infection is acute). The late signs of the disease are pneumonia (nostril flare, nasal discharge, cough), septic arthritis/physitis (swollen joints, periarticular edema, lameness, fever), diarrhea, meningitis (seizures, disoriented behavior), infected umbilicus. Laboratory data indicative of neonatal septicemia are: low white blood count initially; hypoglycemia (low blood glucose); acidosis (low bicarbonate); dehydration (elevated hematocrit); low arterial oxygen levels.

Affected foals should be rehydrated, receive energy and be treated for acidosis. They should be fed, either through nursing, bottle feeding, or tube feeding. If the foal can not tolerate enteral (orally administered) feeds then intravenous glucose or intravenous parenteral nutrition (fats, protein, glucose, vitamins) should be given.

General nursing care and careful monitoring of vital signs are very important. These foals need to be provided for on a 24-hour a day basis. The body temperature should be maintained, the foal should be turned and helped to stand. When lying down, the animal should be kept in a sternal position, and the bedding should be kept dry and soft to prevent pressure sores. Arterial blood gas samples are monitored to determine if supplemental oxygen or ventilatory support is required.

Animals with low blood oxygen should receive intranasal oxygen. Foals in respiratory failure should be supported on a respirator. Colostrum or intravenous plasma should be given to provide antibodies. Blood cultures should be performed and antibodies administered, along with anti-ulcer medications.

Neonatal maladjustment syndrome is a non-infectious condition characterized by abnormal behavior in the newborn foal. Signs usually appear within the first 48 hours of life. Birth asphyxia is believed to be a major cause resulting in varying degrees of brain and spinal cord edema. The birth of such a foal may have been outwardly normal. The condition is frequently associated with premature placental separation, dystocia, and Caesarean section.

The signs of the disorder are seizures, sudden loss of suckle and inability to recognize or follow mare, apparent blindness, aimless wandering, abnormal vocalization, body lean and inability to place limbs properly. Such a foal is treated with anticonvulsants and drugs to reduce cerebral edema. The animal must be protected from self-trauma and it needs to receive nutrition until it learns to suckle. Colostrum and/or plasma should be given.

Premature or immature foals present a challenge to the practitioner. Usually gestation is less than 320 days. Often this is due to an abnormal intrauterine environment; the mare may have been old or sick or undernourished, or the placenta may have been abnormal due to infection or twinning.

These foals have a low birth weight, their forehead is domed, the coat is silky and the ears are floppy. They show joint and flexor tendon laxity. Their body system is not able to maintain body temperature or normal blood sugar levels. The lungs are immature and cannot be fully expanded, resulting in low blood oxygen and increased carbon dioxide. These foals are not able to tolerate the normal volume of milk, they are prone to colic and intestinal distension. They are also highly susceptible to infection.

Premature foals have to be kept warm on well padded bedding. They need to be kept in a sternal position to help them breathe. Physical therapy should be given to help strengthen muscle and tendons. They need supplemental feeding and IV glucose or parenteral nutrition to maintain normal blood glucose levels. Antibiotics and IV plasma may also be necessary, as may intranasal oxygen or mechanical ventilation.

Dr. Vaala explained that sick foals should be transported in a heated vehicle, wrapped in blankets. They should wear protective head gear and have their legs wrapped. To ease their breathing these animals should be kept in a sternal position. She also said that in the case of a newborn, the placenta should be brought along to the veterinarian, as well as a complete history of birth and post partum treatment.

TABLE I: NORMAL PARAMETERS

Pregnancy/Parturition

Average gestation length = 341 days (320-365 days)
- premature (< 320 days)
- prolonged (> 365 days)

Stage I labor = 10 minutes to 6 hours (average 1 hour)
Stage II labor = 5-30 minutes (average 15-20 minutes)
Stage III labor = 30 minutes-3 hours (average 1 hour)

Foal behavior

Time to suckle reflex: 5 to 20 minutes
Time to stand: Mean 60 minutes (15-165 minutes)
Time to nurse: Mean 111 minutes (35 to 200 minutes)
Heart rate:
- 1-5 minutes of life = mean 70 BPM
- 6-60 minutes of life = mean 130-150 BPM
- 9 hours to second day of life = mean 96 BPM

Breathing rate: 30 breaths per minute
Body temperature: 99° F - 101° F
Foal passes most meconium within first 24 hours
Foal urinates within an average of 8 hours.

TABLE II: CONDITIONS ASSOCIATED WITH HIGH RISK FOALS

Maternal conditions:
- abnormal vaginal discharge
- fever
- excessive accumulation of fetal fluids
- colic surgery/general anesthesia
- endotoxemia; severe maternal illness
- excessive drug administration
- pelvic injury/hindlimb instability
- poor nutritional status
- premature lactation
- history of having premature foal or foal with neonatal isoerythrolysis, neonatal maladjustment syndrome, congenital anomalies
- prolonged transport prior to parturition

Periparturient events:
- premature parturition
- abnormally long gestation
- prolonged labor
- dystocia
- induction of labor
- early umbilical cord rupture
- Caesarean section
- premature placental separation
- placentitis (fungal, bacterial)

Neonatal conditions:
- meconium stained fluid on foal; meconium aspiration
- twins
- orphan
- inadequate absorption of colostrum (failure of passive transfer)
- immaturity/prematurity
- exposure to infectious diseases
- birth trauma
- congenital anomalies
- any foal not able to stand and nurse within three hours of birth

a.

b.

c.

a. Premature and septicemic standard bred colt shown here in our foal sling used to help him stand and to prevent excessive weight bearing on his incompletely calcified bones. Infusion pumps seen in the background. Foal was being fed intravenously. b. Premature Thoroughbred foal being supported in sternal recumbency; tape around muzzle is holding intranasal oxygen catheter in place. c. Premature Thoroughbred foal with immature lungs on the high frequency ventilator. Note pillows for support and protection.

Emergency Treatment on the Farm

Dr. Midge Leitch, a practitioner from Cochranville, PA, spoke about emergency treatment which can be handled on the farm. She explained that the decision whether to take the animal to a hospital or to attempt treatment on the farm depends on the facilities available and the experience of the veterinarian.

Colic or abdominal distress is one of the most frequent causes for an emergency call to the veterinarian. Some can be treated on the farm. The veterinarian performs a physical exam; basic laboratory tests such as complete blood count, electrolyte check and a peritoneal fluid analysis are helpful in making the diagnosis and determining the cause of the condition. The veterinarian may perform a gastric lavage and give analgesics to make the animal more comfortable. Lavage, a therapeutic measure, also is of help in establishing a diagnosis. Fluids and electrolytes may be administered, orally if it is a mild case, and intravenously if the animal is in severe distress, to achieve stabilization of the patient.

Mares, in addition to having abdominal diseases common to the horse, can be prone to additional problems such as large colon displacement which most frequently can occur between foaling and six weeks thereafter. The displacement may be partial or complete. Uterine torsion can also happen prior to foaling; it is discussed in more detail in Dr. Orsini's presentation.

Newborn foals often develop abdominal trouble. One of the major causes is meconium impaction. It can be relieved by an enema or a laxative. However, one should be cautious with the laxative to avoid diarrhea.

Diarrhea in a young foal can be life-threatening and a prompt determination of the cause is necessary. Foal diarrhea can be due to viral/bacterial infection or milk allergy. Dr. Leitch recommended that treatment with anti-diarrheal medication and fluids be commenced at once to prevent the young animal from becoming dehydrated and weak.

Gastric/duodenal ulcers are a great problem in young foals, particularly if the animal is stressed due to disease. It is important to recognize the early signs such as toothgrinding, salivation, retching and depression. Treatment consists of the administration of anti-ulcer medication and drugs to coat and protect the stomach and determination of the underlying cause of stress.

Young foals are also prone to urinary bladder rupture. Such foals often have a pot-bellied appearance by the third day of life and appear depressed. Tests show electrolyte imbalance. The animals may be able to urinate streams of urine, though they have a small leak in the bladder. Treatment is by surgery.

Complications due to foaling can result in two patients, the mare and the foal. Dystocia can cause damage to the mare's reproductive tract and sometimes she can suffer a secondary cardiovascular collapse after dystocia. If a mare has been severely stressed during foaling, there is the danger of laminitis occurring. Stressful birth also causes complications for the foal and such animals often are prime candidates for neonatal intensive care. Dr. Leitch recommended that horse breeders keep oxygen on hand for a distressed foal and that they make every effort to keep the young animal warm.

Dr. Leitch briefly discussed musculo-skeletal problems which constitute an emergency. Septic arthritis and osteomyelitis require prompt treatment to prevent permanent damage. Signs are lameness, joint or soft tissue swelling, and septicemia. Treatment consists of joint lavage, systemic antibiotics and in many cases, referral for arthroscopy/curretage. Fractures are another emergency situation. She stressed that the fractured limb needs to be supported by an appropriate bandage and recommended using pillows to create a support bandage. The animal should be referred to a clinic.

The summaries of the remaining three presentations will appear in the Winter issue. The topics are: *Life-Threatening Complications in the Mare; Serious Injuries to the Athlete; Laminitis.*

Equine Breeders Short Course

The Georgia and Philip Hofmann Research Center of the University of Pennsylvania School of Veterinary Medicine will conduct a two-day Equine Breeders Short Course on Oct. 7 and 8, 1988 at the School's New Bolton Center campus. This course will cover concepts and practical application of various equine techniques and management arrangements.

The first day of the event will be devoted to the care of the brood mare. Faculty members and clinicians will discuss various aspects of breeding. Topics will include mare anatomy, teasing, behavior problems, embryo transfer, pregnancy detection, the newborn foal, hormone tests.

Sessions on the second day will cover the care of the stallion. Topics discussed will include stallion anatomy, stallion management, semen laboratory, semen shipping, behavior problems, AV/phantom training, and fertility problems.

Morning sessions each day will consist of lectures. Demonstrations and participation laboratories will be held each afternoon.

The cost for the two-day program is $450 per person. The fee for each additional person from the same farm is $375. There is a $25 early registration discount for reservations received by September 1. Registrations are limited.

For further information and a registration form, please contact the Section of Reproduction, School of Veterinary Medicine, University of Pennsylvania, New Bolton Center, 382 West Street Road, Kennett Square, PA 19348 or call (215) 444-5800, ext. 2220.

Welcome

The new residents and interns at VHUP and New Bolton Center began their duties on July 1. The new interns at VHUP are: Dr. Mary Beth Callan (V'88); Dr. Rebecca E. Campbell, Tufts University School of Veterinary Medicine; Dr. Della M. Garell, New York State College of Veterinary Medicine; Dr. Darren M. Hawks, University of California; Dr. James E. Hosek, University of Illinois; Dr. Katherine M. James, University of California; Dr. Kyle G. Mathews, University of Wisconsin; Dr. Carlos M. Mongil, Louisiana State University; Dr. Deanna W. Purvis (V'88); Dr. Kenneth W. Simpson, University of Edinburgh.

The new residents at VHUP are: Dr. Kelly G. Akol, Dr. Claire Mainwaring, Dr. Michael Rosenzweig, small animal medicine; Dr. William Saxson, small animal emergency medicine; Dr. David Duclos, dermatology; Dr. Steven Heyman, orthopedic surgery; Dr. Malcolm MacDonald, cardiology; Dr. Katherine Michel, clinical nutrition; Dr. Robert O'Brien, radiology; Dr. David Thomson, soft tissue surgery.

At New Bolton Center the new interns are: Dr. Patricia Blakeslee (V'88), field service; Dr. Carolyn Charlton (V'88); Dr. Janet Douglas, Cambridge University-Thouron Scholar; Dr. Robert Fischer, University of Florida; Dr. Jennifer Garber (V'88); Dr. Sandy Perkowski (V'88); Dr. Christopher Smith, University of California; Dr. Kent Sullivan (V'88).

The new residents are: Dr. Mary Boy (V'87), medicine; Dr. Gregory Staller and Dr. Alan Ruggles, surgery; Dr. Fernando Riera, reproduction; Dr. Robin Brock, field service; Dr. Johanna Reimer, cardiology.

Dr. Wendy Freeman, a resident last year at New Bolton Center, has been appointed a lecturer in field service. Two former residents at VHUP were also appointed as lecturers, Dr. John Fyfe as lecturer in medical genetics and Dr. John Speciale as lecturer in neurology/ophthalmology.

The annual Interns and Residents picnic, sponsored by the Bucks-Montgomery, Keystone, Suburban, and Southern New Jersey Veterinary Medical Associations, takes place on September 14, 1988 at the Philadelphia Zoo. Barbeque and picnic food and beverages will be served on the lawn, beginning at 6 p.m.; in case of inclement weather, the event will take place in the reptile house. This annual picnic brings together the residents, interns and faculty members from the School and practitioners from the area associations in an informal setting.

Calendar

October 7, 8	Equine Breeders Short Course, New Bolton Center
November 8	Equine Therapeutics Continuing Education course New Bolton Center
January 25, 26	Penn Annual Conference Adam's Mark Hotel Philadelphia
January 28	Your Veterinarian and Your Dog 19th Annual Canine Symposium VHUP, Philadelphia
February 8	Small Animal Non-Plating Orthopaedics Laboratory Continuing Education course VHUP, Philadelphia
February 22	Small Animal Spinal Neurosurgery Continuing Education course VHUP, Philadelphia
March 8	Small Animal Surgical Emergencies Continuing Education course VHUP, Philadelphia
March 29	Bovine Therapeutics and the Legal Responsibilities of the Practitioner Concerning Drug Residues Continuing Education course New Bolton Center
April 5	Small Animal Anesthesia Continuing Education course VHUP, Philadelphia
April 15	12th Annual Feline Fanciers Symposium VHUP, Philadelphia
April 16	Cat Show Class of 1923 Ice Rink 3130 Walnut Street Philadelphia